

**REMARKS**

In the Office Action dated May 18, 2006, claims 1-23 are pending. Claims 1, 16, and 19 are independent claims from which all other claims depend respectively therefrom. Claims 1, 9, 11-13, 16-17, 19, and 21 are herein amended. Claims 8, 10, 18, and 20 are herein canceled.

The Office Action, on page 2, states that the Applicants have added new matter to the specification that was not supported by the original disclosure, specifically that "the height H may be determined using thermal modeling techniques known in the art". Applicants admit that this was not explicitly stated in the original disclosure, however, this was implied in stating that the parameter or height H was of a concern and that it is determined and adjusted. In providing the above disclosure, the Applicants were merely explicitly stating that the tools and/or technology, which are known to one skilled in the art, may be used to determine the parameter of concern, which has not been previously considered.

The Office Action of January 24, 2006, stated that the specification does not provide disclosure or guidance for one of ordinary skill in the art to determine or calculate height H. As such, the Applicants assumed, in the previous Response, that the Examiner does not have a full understanding of the knowledge of one of ordinary skill in the art. Thus, Applicants by inserting the above disclosure were providing the Examiner with a better understanding of the knowledge of one skilled in the art and were clarifying that which was intended by the Applicants. One skilled in the art would readily recognize, upon becoming aware of the benefits in controlling or setting the parameter H within a certain range, that the parameter H can be determined using thermal modeling techniques.

The present invention provides awareness with respect to the affects and benefits in adjusting the height of a heat shield. In doing so, the present invention is able to maintain balanced bearing temperatures within a desired temperature range. The novelty of the claimed invention is not necessarily in

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the actual determination of the height H, but rather in recognizing that the height H affects the thermal transfer, balance, and efficiency associated with anode bearings and how the height H affects the same. This is provided in the original disclosure.

Thus, Applicants submit that regardless of whether the statement that, "the height H may be determined using thermal modeling techniques known in the art" is explicitly provided in the specification, adequate disclosure is provided and is enabling for that which is claimed. Referring to MPEP 2163, it is known that information, which is well known in the art, need not be described in detail in the specification. See, e.g., *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379-80, 231 USPQ 81, 90 (Fed. Cir. 1986). "Known ways of performing a known operation cannot be deemed intentionally concealed absent evidence of intent to deliberately withhold that information." *High Concrete Structures Inc. v. New Enter. Stone & Lime Co.*, 377 F.3d 1379, 1384, 71 USPQ2d 1948, 1951 (Fed. Cir. 2004). "The best mode requirement of [35 U.S.C.] § 112 is not violated by unintentional omission of information that would be readily known to persons in the field of the invention." Applicants believe that the 35 U.S.C. 132(a) specification objection and the 35 U.S.C. 112 rejection are and have been overcome for the above-stated reasons.

Claim 1-23 stand rejected under 35 U.S.C. 112.

Claims 1, 16, and 19 stand rejected for the use of the terms "configure", and "expansion limited" and the recited limitation of "preventing focal spot displacement of greater than approximately 700 $\mu$ m". Although the Applicants believe that there is adequate disclosure for the use of such terms and limitation, Applicants have herein in an attempt to place the case in a condition for allowance, as viewed by the Examiner, have removed such terms and limitation. Applicants note that they reserve the right to amend the claims at a latter date to include such terms and limitation.

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Claim 1 is also rejected for the use of the term "predetermined displacement". Applicants submit that there is adequate disclosure for the use of such term. A "predetermined displacement" is set by a designer in determining an acceptable amount thereof. The original specification of the present application describes in paragraphs [0025]-[0029] how a bearing encasement is formed, how materials of the bearing encasement and components thereof are selected, how the selected material prevent the expansion of the bearing encasement, and the parameters that are considered in selecting the bearing encasement materials. The specification of the present application also discloses that the predetermined displacement varies per application. The predetermined displacement is a result of an operating environment, the materials used, the arrangement and configuration of the components, and various other known factors. Again, through the use of known thermal modeling techniques, one can design an anode assembly via the above-stated parameters to satisfy a desired focal spot displacement maximum. Thermal modeling can provide a designer with a focal spot displacement based on given inputs. Also, the actual calculation of the predetermined amount is not where the novelty of claim 1 lies, but rather the acknowledgement of limiting focal spot displacement by a predetermined amount via a bearing encasement.

The Office Action, in the first full paragraph of page 4, states that claims 17 and 20 stand rejected for reciting the limitations of a heat shield that is configured to maintain temperature continuity between the bearings of an anode bearing encasement. More specifically, the Office Action states that the specification does not describe to one skilled in the art how to determine such parameter, does not recognize the importance of this limitation, or how it affects focal spot displacement. Applicants, respectfully, traverse. The Office Action admits in the same paragraph that this concept is mentioned twice in the specification. This alone clearly shows that the concept is recognized, deemed important, disclosed, and enabling. Referring to MPEP 2164, as long

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as the specification discloses at least one method for making or using the claimed invention that bears a reasonable correlation to the entire scope of the claim, then the enablement requirement of 35 U.S.C. 112 is satisfied. *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970). Applicants submit that in the Summary of the application this concept is explicitly stated in paragraph [0008] and that the associated limitations, as well as the other limitations of claims 17 and 20, are further stated and described with respect to examples in paragraphs [0009], [0023], [0031], and [0032], are shown in Figure 3, and are recited in original claims 8-12, 17, 18, and 20.

Paragraph [0023] and Figure 3 also provide an example of how the focal spot displaces as a result of thermal changes in the componentry of an anode assembly. One skilled in the art can readily see that the adjustment to the height and the use, size, quantity, and placement of the holes of the heat shield affects how thermal energy passes from the anode to the bearings and thus also affects the thermal energy continuity between the bearings. Also, it is stated in paragraph [0031] that in maintaining the height H to less than a predetermined height, the front bearings are able to increase to a temperature that is approximately the same as that of the rear bearings, which provides rotational uniformity of the anode on the shaft. The continuity of the bearing temperatures provides rotational uniformity, which is directly related to focal spot displacement. It is further stated in paragraph [0032] that the configuration of the holes affects the amount of thermal energy transfer to the front bearings and to the rear bearings. Thus, the hole configuration is also directly related to the focal spot displacement.

Although descriptive support is provided, Applicants further note that the fact that a limitation may lack descriptive support in a disclosure as originally filed does not necessarily mean that the limitation is also not enabled. See MPEP 2164 and *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563, 19 USPQ 2d 1111, 1116-17 (Fed. Cir. 1991). Referring to MPEP 2163, which states that there is a strong presumption that an adequate written description

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of the claimed invention is present when the application is filed. The PTO has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims. See *In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976). Applicants submit that the claimed disclosure is adequate written description for recognition by one skilled in the art and that such disclosure is also clearly provided in the specification, as stated above. No evidence or reasons have been provided why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims.

Claim 21 stands rejected for reciting the limitations of: A. determining a maximum focal spot displacement associated with the target of the anode assembly; B. determining a desired elastic modulus of at least one control alloy expansion material for the thermally conductive bearing encasement in response to the maximum focal spot displacement; and C. determining a desired thermal conductivity of a control alloy expansion material. Specifically, the Office Action states that the specification does not provide guidance with regards to element A and that imperfections of other parts may also cause focal spot displacement. Applicants agree that various components and other elements of an x-ray tube can cause focal spot displacement. The present application focuses on the affects that an anode assembly has on focal spot displacement. It is implied that in considering the anode assembly affects on focal spot displacement that the other imperfections, or the states of the other parts, are held constant or are known. This is common practice in considering the affect of any component on a system, especially in performing thermal modeling. Also, as stated above, such displacement can be determined through thermal modeling; therefore, such guidance does not need to be disclosed in the specification.

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The Office Action also states that the specification lacks disclosure or guidance for making the determinations of B. and C. Applicants again traverse. As stated, above such relationships and determinations can be made through thermal modeling.

Thus, since the 35 U.S.C. 112 rejections have been overcome for claims 1-23 and since claims 21-23 have no other associated rejection, claims 21-23 are now novel, nonobvious, and are in a condition for allowance.

Claims 1-15 stand rejected under 35 U.S.C. 102(b) as being anticipated by Kuzniar (U.S. Pat. No. 6,295,338 B1).

Note that claim 1 is herein amended to include the limitations of previously presented claims 8 and 10. The included limitations require a heat shield that prevents thermal energy transfer between an anode and bearings, wherein the height of the heat shield is set for temperature continuity between the bearings, and a thermally conductive bearing encasement that prevents anode expansion.

The Office Action states that Kuzniar discloses a heat shield that is dimensioned to redirect heat flow from the bearings. Regardless of whether this is true, Kuzniar fails to speak to the dimensions of the heat shield, the temperature continuity between anode bearings, and to the dimension of the heat shield to provide temperature continuity between the bearings. Thus, Kuzniar fails to disclose the heat shield claimed. One cannot assume, through merely the disclosure of a heat shield, that the heat shield of Kuzniar is the same or performs the same as the heat shield claimed.

The envelope 26 of Kuzniar, which as referred to by the Office Actions as a bearing encasement, does not limit or prevent the expansion of an anode. Note that the anode of Kuzniar is within the envelope 26.

On page 12, the Office Action states that although Kuzniar does not recognize the problem solved by the present invention, that the disclosed structure of Kuzniar satisfies the claimed limitations. Applicants agree that a

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problem does not need to be recognized, but submit that the failure to recognize the problem suggests that the problem is not solved, which is the case here. Kuzniar does not recognize or solve the problem of bearing temperature discontinuity.

Thus, Kuzniar fails to teach or suggest each and every limitation of claim 1. Therefore, claim 1 is novel, nonobvious, and is in a condition for allowance. Since claims 2-7, 9, and 11-15 depend from claim 1, they too are novel, nonobvious, and are in a condition for allowance for at least the same reasons.

Claims 16-20 stand rejected under 35 U.S.C. 102(b) as being anticipated by Lu (U.S. Pat. No. 6,603,834 B1).

Claim 16 is herein amended to recite the limitations of a thermal shield that has one or more holes, for the transfer of thermal energy, that extend radially inward from an anode to a bearing. Applicants submit that this is not taught or suggested by Lu.

The Office Action states that Lu teaches a heat shield that has a hole. Applicants submit that the hole in the heat shield of Lu is an axially extending hole and does not extend radially between an anode and anode bearings. Thus, Lu fails to teach or suggest each and every limitation of claim 16 and of dependent claim 17.

Claim 19 is amended to recite a heat shield that has one or more holes, for the transfer of thermal energy, that extend radially inward towards an axis of rotation and facilitates temperature continuity between front bearings and rear bearings of one or more bearings. This is also not taught or suggested by Lu. See above arguments. Thus, Lu fails to teach or suggest each and every limitation of claim 19 and dependent claim 20.

Therefore, claims 16, 17, 19, and 20 are also novel, nonobvious, and are in a condition for allowance.

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On page 12, the Office Action, with respect to claim 12, states that the term "radially oriented" does not provide structural significance. Claim 12 is herein amended to state that the hole extends radially relative to the axis of rotation of the anode. This provides structural significance and the requested relativity.

In light of the amendments and remarks, Applicants submit that all of the objections and rejections are now overcome. The Applicants have added no new matter to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments, he is respectfully requested to contact the undersigned attorney.

Respectfully submitted,

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